LEAD-BASED PAINT and ASBESTOS SURVEYS FOR PORT OF PORTLAND AT TERMINALS 2 and 4 PORTLAND, OREGON

CONDUCTED
OCTOBER 27, 30 and 31, 1995

Prepared for:

Mr. Ted Winter
Port of Portland, Marine Operations
Box 3529
Portland, Oregon 97208

Prepared by:

Ken Semore, Industrial Hygienist
Marine & Environmental Testing, Inc.

Reviewed by:

Troy Corbin, CIH, CSP
Marine & Environmental Testing, Inc.

LEAD-BASED PAINT AND ASBESTOS SURVEY
FOR
PORT OF PORTLAND
TERMINALS 1 AND 4
PORTLAND, OREGON

EXECUTIVE SUMMARY

Marine & Environmental Testing, Inc. (M&ET) Industrial Hygienist Ken Semore conducted lead-based paint and asbestos surveys for the Port of Portland (POP) on October 27, 30 and 31, 1995. The purpose of the surveys was to determine whether paint coatings on the water towers and associated pumphouses at Terminals 1 and 4 contain any significant concentrations of lead. In addition, the outbuilding adjacent to the Terminal 4 water tower and old Outloader Building and the abandoned POP Shop Building located at Terminal 4 were included in the survey. The water towers, pumphouses and buildings were also inspected for asbestos-containing materials. All of these structures and buildings are scheduled for demolition.

Terminal 1 and 4

Lead Results

Survey results indicate that the paint coatings on the exterior of the water towers and exteriors and interiors of the other listed structures, including tanks, equipment, piping, valves and boilers etc., contain lead. Some paint coatings contain significant concentrations of lead, while others contain small amounts. Paint coating sample locations and results are located in Appendix A of this report.

Asbestos results

Survey results indicate that limited amounts of asbestos-containing materials exist at both Terminals. Marine & Environmental Testing, Inc. asbestos bulk sample locations and results, and EMC Laboratory analytical results, are located in Appendix B of this report.

SAMPLING AND ANALYTICAL METHODOLOGY

Lead

Niton XL Spectrum Analyzer Lead Detector

The survey was conducted using a direct reading Niton XL Spectrum Analyzer Lead Detector, Model 309, which uses X-Ray Fluorescence technology (XRF). Detection limits of the instrument are 0.1 milligrams per centimeter squared (mg/cm^2) to 5.0 mg/cm^2; concentrations higher than 5.0 mg/cm^2 are indicated by >5.0 mg/cm^2.

The instrument is a portable battery-operated device designed to take quick, accurate, non-destructive measurements of lead concentrations in paint coatings using L Shell and K Shell XRF technology. The instrument produces accurate results independent of the type or thickness of paint, and independent of the substrate (wood, metal, concrete etc.).

The sample area for the instrument is 1 centimeter by 2 centimeters. Direct readings are obtained in 3 to 4 seconds for surface lead and in 15 seconds for buried lead when the radiation source is fresh.

A field calibration check was performed prior to the survey using the American National Standards Institutes (ANSI) lead paint strip chart to ensure the accuracy of instrument readings. Results of the field calibration check indicated that the instrument was operating properly and within designed calibration limits.

Lead results are located in Appendix A.

Asbestos

Industrial Hygienist Ken Semore is an Accredited Asbestos Inspector through the EPA's Asbestos Hazard Emergency Response Act (AHERA). Mr. Semore is an accredited Oregon Asbestos Supervisor.

A total of 17 bulk samples were collected during the survey. Of the 17 bulk samples, 5 were collected from the pumphouse at Terminal 1, 9 were collected from the old Outloader Building, and 3 were collected from the old shop building located at Terminal 4.

Bulk samples were collected using methods to minimize damage to the host material sampled. All sample locations were wetted with amended water prior to sampling and were sprayed with an encapsulant after sampling. Bulk samples were placed in resealable plastic bags. Data pertinent to each sample (i.e., date, sample I.D. number, location and description) were recorded. Bulk analysis of the samples was performed by EMC Laboratory using EPA Analytical Method, 40 CFR Chapter 1, Part 763, Subpart F: PLM/Dispersion Staining. EMC Laboratory's Analytical Report is located in Appendix B.

SURVEY RESULTS

XRF Readings - Lead

Paint coatings with XRF readings greater than 0.0 $\pm$ 0.1 mg/cm^2 should be considered to contain lead. Experience has shown that the level of detection is approximately 0.1% (1000 ppm). Readings of $\geq$ 0.1 $\pm$ 0.0 mg/cm^2 typically have lead concentrations of 1% (10,000 ppm) or greater. The higher the reading, the greater the lead content.

MARINE TERMINAL 1

Lead Results

Water Tower

Survey results indicate that the exterior paint coatings on the water tower leg supports, main tank and circular walkway contain small concentrations of lead. The approximate average lead concentration on these structures was 0.0 mg/cm^2 $\pm$ 0.1 mg/cm^2. However, the water tower ladder and circular walkway handrails contain significant concentrations of lead. The approximate average lead concentrations on these structures were 2.63 mg/cm^2 and 1.08 mg/cm^2 respectively.

Pumphouse

The exterior of the pumphouse is not painted. Survey results indicate the paint coatings on the pumphouse boiler contain on average 0.14 mg/cm^2 of lead. Paint coatings on the pipes, valves and associated connected pipe equipment (nuts and bolts, etc.) inside the pumphouse contain significant concentrations of lead. The average lead concentration was 1.16 mg/cm^2. However, a few concentrations were >5.0 mg/cm^2.

Asbestos Results

Water Tower

Visual inspection of the exterior of the water tower revealed that there were no insulating materials on the water tower.

Pumphouse

The survey results indicate that the compressed fibrous board materials on the interior walls and ceiling of the pumphouse *do not* contain asbestos. However, the insulation materials on the boiler *do* contain asbestos.

MARINE TERMINAL 4

Lead Results

Water Tower

Survey results indicate that the exterior paint coatings on the water tower leg supports, leg support footings, main tank, and walkway handrail contain significant concentrations of lead. The average lead concentration of these structures is 0.42 mg/cm^2. The highest lead concentration is 4.0 mg/cm^2. The water tower ladder and circular walkway contain small concentrations of lead. The average lead concentration of these structures is 0.1 mg/cm^2.

Pumphouse

Survey results indicate that paint coatings on the exterior of the pumphouse and interior piping, valves, nuts and bolts etc. of the pumphouse contain low concentrations of lead. The average lead concentration was 0.27 mg/cm^2. The highest lead concentration was 0.4 mg/cm^2.

Outbuilding

Survey results indicate that exterior paint coatings on the outbuilding located adjacent to the water tower and pumphouse contain low concentrations of lead. Average lead concentration on the exterior paint coatings was 0.16 mg/cm^2. The interior of the outbuilding was not evaluated, since it was secured and the security officers could not gain access.

Shop Building

Survey results indicate that exterior paint coatings on the Shop Building contain high concentrations of lead. The average lead concentration was 2.83 mg/cm^2, and it was not uncommon to have lead concentrations of >5.0 mg/cm^2. Paint coatings on the interior wood structures were lower than the exterior paint coatings, with an average concentration of 0.96 mg/cm^2. However, most of the lead concentrations were 0.0 mg/cm^2 plus or minus 0.1 mg/cm^2. All high lead concentrations (greater than 1.0 mg/cm^2) were on isolated materials or in isolated areas.

Old Outloader Building

Survey results indicate that the majority of exterior paint coatings of the Outloader Building contain low concentrations of lead. The average lead concentration was 0.0 mg/cm^2, plus or minus 0.1 mg/cm^2. However, several high lead concentrations (greater than 1.0 mg/cm^2) were recorded on isolated materials or in isolated areas.

Asbestos Results

Water Tower and Pumphouse

No suspect asbestos-containing materials were observed on the exterior of the water tower and pumphouse. No insulation materials were observed within the pumphouse. There is a small amount of fiberglass insulation located where the main waterline enters the roof of the pumphouse, but is not suspected to contain asbestos.

OutBuilding

No suspect asbestos-containing materials were observed on the exterior or interior of the Outbuilding. No insulation materials were observed within the pumphouse.

Old Shop Building

No suspect asbestos-containing materials were observed in the interior of the old Shop Building. However, the exterior roofing materials contain asbestos.

Note: A pipe traveling from the old boiler house (not included in the survey) into the Shop Building is insulated with a fibrous corrugated paper material. The appearance of the pipe insulation matches that of asbestos-containing pipe insulation commonly applied to pipe during the era in which the Boiler was constructed. The pipe insulation is strongly suspected to be an asbestos-containing material.

Old Outloader Building

The only suspect asbestos-containing material observed on the interior of the old Shop Building was the sheetrock on the interior walls. Bulk sample analytical results of these materials indicate that the sheet rock materials *do not* contain asbestos. However, the roofing materials *do* contain asbestos.

Note: Portions of the walls in both the old shop building and old outloader building are insulated with fiberglass or similar materials. These materials were not bulk sampled since they are not suspected to be asbestos-containing materials.

Additional Comments

This report was prepared from information obtained during several site visits. The survey inspector was not escorted through any of the buildings. No architectural plans pertaining to the buildings/structures were available for inspection during the survey.

The surveys were limited to areas normally occupied by or accessed by building occupants or maintenance personnel. Other lead-based paints and asbestos-containing materials may exist on or within the buildings/structures, but were not discovered during the survey due to physical barriers (i.e., inaccessible confined spaces, walls and ceilings, structural supports etc.). An example of inaccessible areas/spaces would be inside the main tanks of the water towers, the upper exterior portions of the water towers' main tanks, and their leg supports, which do not have ladders on them.

APPENDIX A

MARINE & ENVIRONMENTAL TESTING, INC.
XRF REPORT

LEAD SURVEY RESULTS PORT OF PORTLAND TERMINAL 1, WATER TOWER October 27, 1995		
Sample #	**Location**	**Results (mg/cm^2)**
1	Field calibration check using ANSI paint film chart.	1.7 ± 0.1
	Water Tower leg supports, ground level.	
2	NE leg support; white.	0.0 ± 0.1
3	NE leg support; white.	0.0 ± 0.2
4	NE leg support; white.	0.0 ± 0.1
5	NE leg support; white.	0.0 ± 0.1
6	NW leg support; white.	0.0 ± 0.1
7	NW leg support; white.	0.0 ± 0.1
8	SW leg support; white.	0.0 ± 0.2
9	SW leg support; white.	0.0 ± 0.1
10	SE leg support; white.	0.0 ± 0.2
11	SE leg support; white.	0.0 ± 0.2
	Pumphouse, double doors.	
12	Exterior, right side upper area; blue.	0.0 ± 0.1
13	Exterior, right side lower area; blue.	0.0 ± 0.1
14	Exterior, left side upper area; blue.	0.0 ± 0.1
15	Interior, right side; blue.	0.1 ± 0.1
16	Interior, left side; blue.	0.1 ± 0.1
	Pumphouse, interior structures.	
17	Vertical pipe; blue.	0.0 ± 0.1
18	Valve, upper level horizontal pipe; blue.	0.1 ± 0.1
19	Actuator valve, horizontal pipe; blue.	0.1 ± 0.1
20	Vertical pipe adjacent to stairs; orange.	>5.0
21	Vertical pipe, east wall; grey over orange.	>5.0
	Pumphouse boiler structures.	
22	Access door, right front upper portion; silver.	0.0 ± 0.1
23	Access door, left front upper portion; silver.	0.0 ± 0.1
24	Access door, front lower area; silver.	0.0 ± 0.2
25	Foundation, front; red.	0.0 ± 0.2
26	Foundation, right side; red.	0.0 ± 0.1

mak\a:\lb37\pop-95.452

LEAD SURVEY RESULTS PORT OF PORTLAND TERMINAL 1, WATER TOWER October 27, 1995		
Sample #	**Location**	**Results (mg/cm^2)**
	More Pumphouse interior structures.	
27	Lower horizontal main feed pipe, south; grey	0.8 ± 0.1
28	Lower horizontal main feed pipe, north; grey.	0.9 ± 0.1
29	Lower horizontal secondary feed pipe; red.	0.0 ± 0.1
30	Lower horizontal secondary feed pipe; red.	0.2 ± 0.1
31	Holding tank over main feed line; grey.	>5.0
32	Main feed line to tower above Pumphouse, west side; blue.	0.6 ± 0.1
33	Main feed line to tower above Pumphouse, east side; blue.	0.6 ± 0.1
	Readings while climbing tower.	
34	Ladder accessing tower, lower portion; yellow.	3.2 ± 0.5
35	Ladder accessing tower, middle portion; yellow.	1.8 ± 0.1
36	SE leg support, upper midway portion; white.	0.1 ± 0.2
37	SE leg support, upper midway; yellow.	2.2 ± 0.3
38	SE leg support, upper area; white.	0.0 ± 0.1
	Top of Water Tower.	
39	Handrail, east side; yellow.	0.0 ± 0.2
40	Tank wall, east side; blue.	0.0 ± 0.1
41	Tank wall, east side; white.	0.0 ± 0.1
42	Handrail north side; yellow.	0.4 ± 0.1
43	Tank wall, north side; blue.	0.0 ± 0.1
44	Walkway, north side; blue.	0.0 ± 0.2
45	Walkway, west side; blue.	0.1 ± 0.4
46	Tank wall, west side; white.	0.0 ± 0.1
47	Walkway, south side; blue.	0.0 ± 0.1
48	Handrail, south side; yellow.	2.5 ± 0.3

LEAD SURVEY
PORT OF PORTLAND
TERMINAL 4, OLD OUTLOADER/BUILDING 544
October 27, 1995

Sample #	Location	Results (mg/cm^2)
1	Field calibration check using ANSI paint film chart. OK	1.6 ± 0.2
	Outloader/Building 544, exterior.	
2	South door; rusted yellow.	0.0 ± 0.1
3	South interior side; rusted yellow.	0.0 ± 0.1
4	South wall galvanized metal; beige.	0.0 ± 0.1
5	South wall galvanized metal; silver.	0.1 ± 0.1
6	East bay door, left side; yellow.	>5.0
7	East bay door, right side; yellow.	>5.0
8	North leg support to air ducting, yellow.	3.9 ± 0.4
9	North hopper leg support; yellow.	2.1 ± 0.2
10	North electrical control panel; grey.	0.0 ± 0.2
11	Hopper ladder access; yellow.	>5.0
12	Hopper leg support; yellow.	1.6 ± 0.1
13	Hopper platform foundation; yellow.	0.0 ± 0.1
14	Hopper platform vertical handrail stanchion; yellow.	0.0 ± 0.1
15	Hopper platform, horizontal steel beam; rusted, some blue remaining.	>5.0
16	Hopper cone, bottom; rusted, some blue remaining.	0.0 ± 0.3
17	East side of conveyor, metal siding, lower end; beige.	0.0 ± 0.1
18	East side of conveyor, metal siding, middle portion; beige.	0.0 ± 0.1
19	Door to air compressor room under conveyor; white, rusted.	0.0 ± 0.1
20	Vertical steel support member under conveyor; black, rusted.	0.0 ± 0.3
21	Steel cross member support; black.	0.0 ± 0.1
22	Steel cross member support, bottom; black.	0.0 ± 0.1
23	Large vertical steel support beam at base of outloader, dockside; reddish, rusted.	0.0 ± 0.1
24	Fire hose rack attached to above support beam; red.	0.0 ± 0.1
25	Ladder accessing outloader; red, rusted.	0.0 ± 0.1
26	Vertical support beam at base of outloader; red.	0.0 ± 0.1
27	Cross member, under outloader, adjacent to dock; red.	0.1 ± 0.1

LEAD SURVEY
PORT OF PORTLAND
TERMINAL 4, OLD OUTLOADER/BUILDING 544
October 27, 1995

Sample #	Location	Results (mg/cm^2)
28	Steel guard around piping under conveyer; white with red tape striping.	2.9 ± 0.7
29	Handrail laying on ground west of conveyor; white.	0.0 ± 0.1
30	Handrail laying on ground west of conveyor; white.	0.0 ± 0.1
31	North side of Bldg., exterior metal siding; grey.	0.1 ± 0.1
32	North side, Bldg., exterior metal siding, upper level; grey.	0.1 ± 0.1
33	North side, Bldg., exterior window casing; grey.	>5.0
34	North side, Bldg. exterior, door; white.	0.0 ± 0.1
35	North side, wall of upper control inspection booth; blue/ green.	0.0 ± 0.2
36	North side, wall of upper control inspection booth; blue/ green.	0.0 ± 0.2
37	West side, support structure for wooden stairs to upper control booth; white.	0.0 ± 0.1
38	Wooden step of above stairs; white paint deteriorate on surfaced.	0.0 ± 0.1
39	NW corner, door; whitish/beige with blue undercoat.	>5.0
40	NW corner, curb; yellow.	0.9 ± 0.1
41	West bay door, left; yellow.	>5.0
42	South wall, plywood; whitish/blue.	0.0 ± 0.1
43	South wall, plywood; whitish/blue.	0.0 ± 0.1
44	East bay door; yellow.	>5.0
45	North wall, NE area; white.	0.0 ± 0.1
46	North wall, center area; light blue.	0.0 ± 0.1
47	Northwest wall; white.	0.0 ± 0.1
48	Southwest wall, white.	0.0 ± 0.1
	Interior of conveyor housing.	
49	2' x 4' wooden handrail, red.	0.0 ± 0.1
50	Vertical 4' x 4' wood support beam;	>5.0
51	3" pipe; silver/red, rusted.	>5.0
52	2" pipe; red, rusted.	0.3 ± 0.1
53	Conveyor belt roller; orange.	0.6 ± 0.1
54	Conveyor belt roller foundation; grey.	0.0 ± 0.1

LEAD SURVEY
PORT OF PORTLAND
TERMINAL 4, OLD OUTLOADER/BUILDING 544
October 27, 1995

Sample #	Location	Results (mg/cm^2)
55	Conveyor belt roller foundation; grey.	0.0 ± 0.1
56	Conveyor belt roller foundation; orange.	1.6 ± 0.3
57	Sheet metal wall, adjacent to access; off-white.	0.1 ± 0.1
58	Conveyor holding container, below ground; red.	0.1 ± 0.1
59	Conveyor holding container, below ground; red.	0.1 ± 0.1
60	Conveyor holding container, below ground; red.	0.1 ± 0.1
61	Conveyor holding container, below ground; red.	0.1 ± 0.1
62	Lid to conveyor holding container, below ground; yellow.	3.0 ± 0.5
63	Conveyor structural support member below ground; grey.	0.0 ± 0.2
64	Handrail; yellow.	2.1 ± 0.3
65	2" x 4" handrail, top of section of conveyor; grey.	>5.0
	House at top of conveyor system.	
66	Access lid to equipment; yellow.	3.9 ± 0.4
67	West wall of control booth; white.	0.0 ± 0.2
68	Side wall of equipment, red.	0.0 ± 0.3
69	Upper load-out, vertical steel beam; red.	3.2 ± 0.4
70	Gearbox motor; red.	0.0 ± 0.1
71	Horizontal support beam under conveyor; pink.	>5.0
72	Support structure under gearbox motor; pink.	>5.0
73	Gearbox platform foundation; red, rusted.	0.0 ± 0.

LEAD SURVEY PORT OF PORTLAND TERMINAL 4, OLD MAINTENANCE SHOPS: ENTIRE STRUCTURE EXCEPT FAR EAST END October 27, 1995		
Sample #	**Location**	**Results (mg/cm^2)**
1	Field calibration check; OK.	3.6 ± 0.3
	Exterior of Maintenance Shop.	
2	NE wall metal siding; beige.	>5.0
3	NE sliding door to shop; blue.	>5.0
4	North wall window casing; blue.	>5.0
5	North wall middle sliding door to shop; blue.	0.1 ± 0.1
6	North wall metal siding; beige.	>5.0
7	NW wall sliding door to shop; blue.	0.1 ± 0.1
8	NW wall metal siding; beige.	>5.0
9	West side wall metal siding; beige.	>5.0
10	West side wall window casing;	>5.0
11	SW side wall metal siding; beige.	2.5 ± 0.5
12	SW wall sliding door; blue.	0.0 ± 0.2
13	South side wall metal siding; beige.	0.4 ± 0.1
14	South side wall sliding door; beige.	0.0 ± 0.1
15	SE wall metal siding;	0.1 ± 0.1
16	SE wall sliding door; blue.	>5.0
17	SE wall sliding door; grey.	>5.0
18	SE wall sliding door jamb; green.	2.4 ± 0.4
	Interior of Maintenance Shop, main floor.	
19	SE office, outside wall; white.	0.0 ± 0.1
20	SE office, SE wall; green.	0.0 ± 0.1
21	SE office wall; green.	0.0 ± 0.1
22	East end of bldg., support beam; white.	0.0 ± 0.1
23	Wood paneling below stairs; white.	0.0 ± 0.1
24	Lower landing of stairs, interior wood wall; white.	0.0 ± 0.1
25	Lower landing of stairs, interior wood wall; grey.	0.0 ± 0.1
26	South center office, interior wall; white.	0.0 ± 0.1
27	South center office, window casing; white.	0.0 ± 0.1

LEAD SURVEY
PORT OF PORTLAND
TERMINAL 4, OLD MAINTENANCE SHOPS:
ENTIRE STRUCTURE EXCEPT FAR EAST END
October 27, 1995

Sample #	Location	Results (mg/cm^2)
28	South center office, east wall; beige.	0.0 ± 0.1
29	SW shop interior wall; grey.	0.0 ± 0.1
30	South bathroom, stall; beige.	1.9 ± 0.5
31	South bathroom, wall; beige.	3.5 ± 0.1
32	South bathroom, wall; white.	>5.0
33	South bathroom, wall; rust.	1.0 ± 0.4
34	Door casing to bathroom; blue.	0.0 ± 0.3
35	Office wall near bathroom; beige.	0.0 ± 0.1
36	Paint Shop wall; white.	0.0 ± 0.1
37	Paint Shop, south wall; white.	0.0 ± 0.1
38	Paint Shop, west wall; white.	>5.0
39	Paint Shop, steel-cased exit door; blue.	>5.0
40	SW corner office, west wall; white.	0.0 ± 0.1
41	SW corner office, east wall; white.	0.0 ± 0.1
42	SW corner office, north wall; white.	0.0 ± 0.1
43	SW stairs, wood; blue.	0.0 ± 0.1
44	SW stairs; yellow.	0.18 ± 0.2
45	NW office, outer wall; white.	0.0 ± 0.1
46	North center section support beam; white.	0.0 ± 0.1
47	NE office, outer wall; white.	0.0 ± 0.1
48	NE office, sliding door; grey.	>5.0
49	NE office wall; white.	0.0 ± 0.1
50	East wall open area; white.	0.0 ± 0.1
51	SE wall open area; white.	0.0 ± 0.1
52	Loft, east side, north wall; white.	0.0 ± 0.1
53	Welding Shop, south sliding door; blue.	0.0 ± 0.1
54	Welding Shop, south wall; white.	0.0 ± 0.1
55	Welding Shop, east wall; white.	0.0 ± 0.1
56	Welding Shop, NE corner wall; white.	>5.0

LEAD SURVEY PORT OF PORTLAND TERMINAL 4, OLD MAINTENANCE SHOPS: ENTIRE STRUCTURE EXCEPT FAR EAST END October 27, 1995		
Sample #	**Location**	**Results (mg/cm^2)**
57	Welding Shop, north wall; white.	>5.0
58	Welding Shop, NW wall; white.	0.0 ± 0.1
59	Welding Shop, SW corner wall; white.	0.0 ± 0.1
60	Welding Shop, west window casing; green.	>5.0
	Interior of Loft in Maintenance Shop.	
61	Timber support, loft, east end; white.	0.0 ± 0.2
62	Stairs, top of landing; grey.	0.0 ± 0.2
63	SW timber support, west; white.	0.0 ± 0.1
64	West wall; white.	0.0 ± 0.1
65	South wall; white.	0.0 ± 0.1
66	Timber support; white.	0.0 ± 0.1
67	Cabinets; greenish blue.	>5.0
68	SW office floor; tan.	0.1 ± 0.2
69	SW office floor; tan.	0.0 ± 0.2
	Interior of Maintenance Shop, main floor.	
70	Main isle open floor area, west; grey.	0.0 ± 0.1
71	Main isle open floor area, center section; green.	0.1 ± 0.2
72	Paint Shop floor; grey.	0.2 ± 0.1
73	Paint Shop floor; grey.	0.8 ± 0.2
74	Main isle open floor area, east; grey.	0.0 ± 0.1
75	Main isle open floor area, NE; grey.	0.1 ± 0.2
	Exterior of Maintenance Shop.	
76	SE corner rain gutter; beige.	0.3 ± 0.1
77	SW area rain gutter; beige.	0.1 ± 0.1

LEAD SURVEY PORT OF PORTLAND TERMINAL 4, WATER TOWER 321 AND OUTBUILDING October 30, 1995		
Sample #	**Location**	**Results (mg/cm^2)**
	Water Tower, ground level.	
1	SE leg support, exterior; silver.	0.3 ± 0.1
2	SE leg support, interior; silver.	0.3 ± 0.1
3	SE leg support, interior; silver.	0.5 ± 0.1
4	NE leg support, exterior; silver.	0.2 ± 0.1
5	NE leg support, exterior; silver.	0.2 ± 0.1
6	NW leg support, exterior; silver.	0.2 ± 0.1
7	NW leg support, interior; silver.	0.2 ± 0.1
8	SW leg support, interior; silver.	0.2 ± 0.1
9	SW leg support, exterior; silver.	0.3 ± 0.1
	Outbuilding adjacent to pumphouse.	
10	Door, right side; red/orange.	0.0 ± 0.1
11	Door, middle section; red/orange.	0.0 ± 0.1
12	Door, left section; red/orange.	0.0 ± 0.1
13	Cinder block wall to left of door; brown.	0.1 ± 0.1
14	Cinder block wall to right of door; brown.	0.1 ± 0.1
15	Cinder block window sill, east side; beige.	0.2 ± 0.1
16	Cinder block wall, north; beige.	0.2 ± 0.1
17	Cinder block wall, west; beige.	0.1 ± 0.1
18	Roof overhang, northwest corner; beige.	0.2 ± 0.1
19	Roof overhang, northeast corner; beige.	0.3 ± 0.1
20	Roof siding, east; beige.	0.2 ± 0.1
21	Roof siding, SW corner; beige.	0.2 ± 0.1
	Water Tower, concrete footings.	
22	SE footing; yellow.	0.8 ± 0.1
23	NE footing; silver.	0.1 ± 0.1
24	NE footing; silver.	0.1 ± 0.1
25	NW footing; silver.	0.2 ± 0.1
26	NW footing; silver.	0.1 ± 0.1
27	SW footing; yellow.	4.0 ± 0.5

LEAD SURVEY PORT OF PORTLAND TERMINAL 4, WATER TOWER 321 AND OUTBUILDING October 30, 1995		
Sample #	**Location**	**Results (mg/cm^2)**
	Outbuilding exterior	
28	South wall; silver.	0.0 ± 0.1
28A	SE wall; silver.	0.1 ± 0.1
29	East wall; silver.	0.1 ± 0.1
30	North wall; silver.	0.0 ± 0.1
31	West wall; silver.	0.1 ± 0.1
	Vehicle wash system piping, adjacent to Outbuilding.	
32	Pipe, white with red stripe.	0.1 ± 0.1
33	Pipe, white with red stripe.	0.0 ± 0.1
34	Pipe, white with red stripe.	0.0 ± 0.1
35	Stanchion; white with red stripe.	0.0 ± 0.1
36	Stanchion; white with red stripe.	0.0 ± 0.1
	Readings while Climbing Water Tower.	
37	Ladder, bottom access; grey.	0.1 ± 0.1
38	Ladder, bottom access; grey.	0.1 ± 0.1
39	SW leg support, midway up; silver.	0.0 ± 0.1
40	SW leg support, lower horizontal crossmember; silver.	0.1 ± 0.1
41	SW leg support, 2/3 of the way up; silver.	0.3 ± 0.1
42	SW support crossmember, 2/3 of the way up; silver.	0.1 ± 0.1
	Top of Water Tower, on circular walkway.	
43	SW side tank wall; silver.	0.7 ± 0.1
44	West side tank wall; silver.	0.5 ± 0.1
45	NW side tank wall; silver.	0.4 ± 0.1
46	NW leg support; silver.	0.4 ± 0.1
47	NE side tank wall; silver.	0.5 ± 0.1
48	East side tank wall; silver.	0.5 ± 0.1
49	South side tank wall; silver.	0.3 ± 0.1
50	SW walkway handrail; silver.	0.2 ± 0.1
51	SW walkway floor; silver.	0.0 ± 0.1
52	SE, walkway handrail; silver.	0.1 ± 0.1

LEAD SURVEY PORT OF PORTLAND TERMINAL 4, WATER TOWER 321 AND OUTBUILDING October 30, 1995		
Sample #	**Location**	**Results (mg/cm^2)**
53	SE walkway floor; silver.	0.2 ± 0.1
54	NE walkway handrail; silver.	0.4 ± 0.1
55	NE walkway floor; silver.	0.0 ± 0.1
56	NW walkway handrail; silver.	0.5 ± 0.1
57	NW walkway floor; silver.	0.1 ± 0.1
	Pumphouse interior.	
58	Main feed line, lower section; silver.	0.4 ± 0.1
59	Main feed line, upper section; silver.	0.2 ± 0.1
60	T-connection, floor; silver.	0.1 ± 0.1
61	Valve off of T-connection, floor; silver.	0.3 ± 0.1

APPENDIX B

MARINE & ENVIRONMENTAL TESTING, INC.
ASBESTOS TABLE

EMC LABORATORY'S ASBESTOS ANALYTICAL REPORT

ASBESTOS SURVEY PORT OF PORTLAND TERMINAL 1, WATER TOWER PUMPHOUSE October 27, 1995			
Sample #	**Sample Location**	**Sample Description**	**Asbestos Content**
	Interior of the Pumphouse.		
1	East wall fiberboard.	2' x 4' compressed fiber board.*	None detected.
2	South wall fiberboard.	2' x 4' compressed fiber board.*	None detected.
3	North wall fiberboard.	2' x 4' compressed fiber board.*	None detected.
4	Boiler casing insulation at top of boiler.	White, fibrous, pre-formed insulation material covered by woven glass material, soiled and damaged.	20% Amosite
5	Boiler casing insulation below access door to boiler.	White, fibrous, pre-formed insulation material covered by woven glass material, soiled and damaged.	5% Chrysotile 15% Amosite

*All of the Pumphouse's interior walls and ceiling are covered with this material.

ASBESTOS SURVEY PORT OF PORTLAND OLD LOAD-OUT/BUILDING 544 October 30-31, 1995			
Sample #	**Sample Location**	**Sample Description**	**Asbestos Content**
	Building 544 and Outloader Building.		
A	Building 544, SE interior wall.	2 layers of sheetrock material and one layer of brown fibrous pressboard material.	None detected
B	Building 544, NE interior wall.	2 layers of sheetrock material and one layer of brown fibrous pressboard material.	None detected
C	Roof material from conveyor belt housing, lower end section.	Roofing material.	10% Chrysotile
D	Roof material on conveyor housing, lower end, under hopper.	Multi-layer granular roofing material on conveyor housing.	<1% Chrysotile
E	Roof material conveyor housing, lower end section.	Significantly deteriorated multi-layer roofing material.	<1% Chrysotile
F	Roof material, Building 544.	Significantly deteriorated multi-layer roofing material.	10% Chrysotile
G	Upper interior conveyor house control room, thick tar paper material on exterior walls.	Black tar-based semi-fibrous material.	None detected
H	Upper interior conveyor house control room, floor material.	Multi-layer black fibrous, friable floor material.	None detected
I	Roof of upper exterior conveyor house control room on top of building.	Black tarry-based semi-fibrous material.	None detected
	Old Maintenance Shop.		
J	Roof material from NE corner section.	Homogenous tar-based, fibrous roofing material over wood.	10% Chrysotile
K	Roof material from midsection.	Homogenous tar-based, fibrous roofing material over wood.	10% Chrysotile
L	Roof material from SE corner section.	Homogenous tar-based, fibrous roofing material over wood.	10% Chrysotile

Note: Bulk samples A through H were collected on October 30, 1995. Bulk samples I through J were collected on October 31, 1995.

mak\a:\ih37\pop-95.453

11/07/95 ENVIRONMENTAL MANAGEMENT CONSULTANTS Page 1
BULK MATERIAL REPORT

REPORT Laboratory Analysis: BULK
Client: Marine & Env Testing
Reported to: Meryle Korn
Sampled from: Pop Tower & Buildings
Shipped via: UPS 2nd Day Received: 11/02/95

LAB: 9442
Methodology: EPA 600/M4-82-020
P/O#:
Proj: H-092
By: Client
Reported: 11/07/95

SAMPLE	IDENTIFICATION	PARAMETER	TEST RESULTS
01	H-092-1 Brown	Asbestos	None detected. This sample contains approx. 70% Cellulose, 30% Perlite, Binder, Quartz.
02	H-092-2 Brown	Asbestos	None detected. This sample contains approx. 70% Cellulose, 30% Perlite, Binder, Quartz.
03A	H-092-3 Brown	Asbestos	None detected. This sample contains approx. 70% Cellulose, 30% Perlite, Quartz, Binder.
03B	H-092-3 Black	Asbestos	None detected. This sample contains approx. 2% Cellulose, 98% Quartz, Binder.
04A	H-092-4 Brown	Asbestos	Trace detected. This sample contains approx. a trace of Amosite, 90% Cellulose, 9% Binder.

Kenneth N. Hokanson

Analyst(s): Ken Hokanson By: Russell Nassof PD __

NVLAP Accreditation #1926, CA ELAP #1913, NY ELAP #11445, TX DOH #30-0094

4455 EAST CAMELBACK ROAD, SUITE D-155 PHOENIX, ARIZONA 85018 PHONE: (602) 840-8012 FAX: (602) 990-8468

11/07/95 ENVIRONMENTAL MANAGEMENT CONSULTANTS Page 2
BULK MATERIAL REPORT

REPORT Laboratory Analysis: BULK
Client: Marine & Env Testing
Reported to: Meryle Korn
Sampled from: Pop Tower & Buildings
Shipped via: UPS 2nd Day Received: 11/02/95

LAB: 9442
Methodology: EPA 600/M4-82-020
P/O#:
Proj: H-092
By: Client
Reported: 11/07/95

SAMPLE	IDENTIFICATION	PARAMETER	TEST RESULTS
04B	H-092-4 Tan	Asbestos	Positive. This sample contains approx. 20% Amosite, 80% CaCO, Quartz, Silica.
05A	H-092-5 Silver	Asbestos	None detected. This sample contains approx. 90% Cellulose, 10% Binder.
05B	H-092-5 Tan	Asbestos	Positive. This sample contains approx. 5% Chrysotile, 15% Amosite, 80% Quartz, CaCO, Silica.

ACCREDITED BY THE NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY, VOLUNTARY LABORATORY ACCREDITATION PROGRAM FOR SELECTED TEST METHODS FOR ASBESTOS. ALL ANALYSES ARE DERIVED FROM CALIBRATED VISUAL ESTIMATE UNLESS OTHERWISE NOTED.

Kenneth R. Hokanson

Analyst(s): Ken Hokanson By: Russell Nassof PD __

NVLAP Accreditation #1926, CA ELAP #1913, NY ELAP #11445, TX DOH #30-0094

4455 EAST CAMELBACK ROAD, SUITE D-155 PHOENIX, ARIZONA 85018 PHONE: (602) 840-8012 FAX: (602) 990-8468

11/08/95 ENVIRONMENTAL MANAGEMENT CONSULTANTS Page 1
BULK MATERIAL REPORT

REPORT Laboratory Analysis: BULK
Client: Marine & Env Testing
Reported to: Meryle Korn
Sampled from: IH95-452-H092-POP
Shipped via: UPS 2nd Day

LAB: 9443
Methodology: EPA 600/M4-82-020
P/O#: H-092
Proj: H-092
By: Client
Received: 11/02/95 Reported: 11/08/95

SAMPLE	IDENTIFICATION	PARAMETER	TEST RESULTS
01A	H092-A Off White Layer 1	Asbestos	None detected. This sample contains approx. 10% Cellulose, 2% Fiber-glass, 88% CaCO, CaSO and Binder.
01B	H092-A Beige Layer 2	Asbestos	None detected. This sample contains approx. 95% Cellulose, 5% CaCO, Binder.
01C	H092-A Brown Layer 3	Asbestos	None detected. This sample contains approx. 95% Cellulose, 5% Binder.
02A	H092-B Off White Layer 1	Asbestos	None detected. This sample contains approx. 5% Cellulose, 2% Fiber-glass, 93% CaCO, CaSO, Binder.
02B	H092-B Brown Layer 2	Asbestos	None detected. This sample contains approx. 90% Cellulose, 10% CaCO and Binder.

Analyst(s): Ken Scheske By: Russell Nassof PD __

NVLAP Accreditation #1926, CA ELAP #1913, NY ELAP #11445, TX DOH #30-0094

4455 EAST CAMELBACK ROAD, SUITE D-155 PHOENIX, ARIZONA 85018 PHONE: (602) 840-8012 FAX: (602) 990-8468

11/08/95 ENVIRONMENTAL MANAGEMENT CONSULTANTS Page 2
BULK MATERIAL REPORT

REPORT Laboratory Analysis: BULK
Client: Marine & Env Testing
Reported to: Meryle Korn
Sampled from: IH95-452-H092-POP
Shipped via: UPS 2nd Day

LAB: 9443
Methodology: EPA 600/M4-82-020
P/O#: H-092
Proj: H-092
By: Client
Received: 11/02/95 Reported: 11/08/95

SAMPLE	IDENTIFICATION	PARAMETER	TEST RESULTS
02C	H092-B Brown Layer 3	Asbestos	None detected. This sample contains approx. 95% Cellulose, 5% CaCO and Binder.
03	H-092 Black	Asbestos	Positive. This sample contains approx. 10% Chrysotile, 10% Cellulose, 80% Binder, CaCO, Quartz.
04	H092-D Black	Asbestos	Trace detected. This sample contains approx. a trace of Chrysotile, 2% Cellulose, 97% CaCO, Quartz and Binder.
05	H092-E Black	Asbestos	Trace detected. This sample contains approx. a trace of Chrysotile, 3% Cellulose, 96% Binder, CaCO and Quartz.
06A	H092-F Black Layer 1	Asbestos	Positive. This sample contains approx. 10% Chrysotile, 10% Cellulose, 80% CaCO, Binder, Quartz.

ACCREDITED BY THE NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY, VOLUNTARY LABORATORY ACCREDITATION PROGRAM FOR SELECTED TEST METHODS FOR ASBESTOS. ALL ANALYSES ARE DERIVED FROM CALIBRATED VISUAL ESTIMATE UNLESS OTHERWISE NOTED.

Analyst(s): Ken Scheske

By: Russell Nassof PD __

NVLAP Accreditation #1926, CA ELAP #1913, NY ELAP #11445, TX DOH #30-0094

4455 EAST CAMELBACK ROAD, SUITE D-155 PHOENIX, ARIZONA 85018 PHONE: (602) 840-8012 FAX: (602) 990-8468

11/08/95 ENVIRONMENTAL MANAGEMENT CONSULTANTS Page 3
BULK MATERIAL REPORT

REPORT Laboratory Analysis: BULK
Client: Marine & Env Testing
Reported to: Meryle Korn
Sampled from: IH95-452-H092-POP
Shipped via: UPS 2nd Day

LAB: 9443
Methodology: EPA 600/M4-82-020
P/O#: H-092
Proj: H-092
By: Client
Received: 11/02/95 Reported: 11/08/95

SAMPLE	IDENTIFICATION	PARAMETER	TEST RESULTS
06B	H092-F Black	Asbestos	Positive. This sample contains approx. 5% Chrysotile, 3% Cellulose, 92% CaCO, Quartz.
07	H092-G Black	Asbestos	None detected. This sample contains approx. 25% Cellulose, 75% Binder, CaCO and Quartz.
08A	H092-H Beige Layer 1	Asbestos	None detected. This sample contains approx. 95% Cellulose, 5% CaCO and Binder.
08B	H092-H Black Layer 2	Asbestos	None detected. This sample contains approx. 3% Cellulose, 97% CaCO, CaSO and Binder.
09	H092-I Black	Asbestos	None detected. This sample contains approx. 50% Cellulose, 50% Binder, CaCO and Quartz.

ACCREDITED BY THE NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY, VOLUNTARY LABORATORY ACCREDITATION PROGRAM FOR SELECTED TEST METHODS FOR ASBESTOS. ALL ANALYSES ARE DERIVED FROM CALIBRATED VISUAL ESTIMATE UNLESS OTHERWISE NOTED.

Analyst(s): Ken Scheske By: Russell Nassof PD

NVLAP Accreditation #1926, CA ELAP #1913, NY ELAP #11445, TX DOH #30-0094

4455 EAST CAMELBACK ROAD, SUITE D-155 PHOENIX, ARIZONA 85018 PHONE: (602) 840-8012 FAX: (602) 990-8468

11/08/95 ENVIRONMENTAL MANAGEMENT CONSULTANTS Page 4
BULK MATERIAL REPORT

REPORT Laboratory Analysis: BULK
Client: Marine & Env Testing
Reported to: Meryle Korn
Sampled from: IH95-452-H092-POP
Shipped via: UPS 2nd Day

LAB: 9443
Methodology: EPA 600/M4-82-020
P/O#: H-092
Proj: H-092
By: Client
Received: 11/02/95 Reported: 11/08/95

SAMPLE	IDENTIFICATION	PARAMETER	TEST RESULTS
10	H092-J Black	Asbestos	Positive. This sample contains approx. 10% Chrysotile, 3% Cellulose, 5% Fiberglass, 82% CaCO and Binder.
11	H092-K Black	Asbestos	Positive. This sample contains approx. 10% Chrysotile, 2% Cellulose, 5% Fiberglass, 83% Binder, CaCO.
12	H092-L Black	Asbestos	Positive. This sample contains approx. 10% Chrysotile, 3% Cellulose, 5% Fiberglass, 82% Binder, CaCO.

ACCREDITED BY THE NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY, VOLUNTARY LABORATORY ACCREDITATION PROGRAM FOR SELECTED TEST METHODS FOR ASBESTOS. ALL ANALYSES ARE DERIVED FROM CALIBRATED VISUAL ESTIMATE UNLESS OTHERWISE NOTED.

Analyst(s): Ken Scheske By Russell Nassof PD __

NVLAP Accreditation #1926, CA ELAP #1913, NY ELAP #11445, TX DOH #30-0094

4455 EAST CAMELBACK ROAD, SUITE D-155 PHOENIX, ARIZONA 85018 PHONE: (602) 840-8012 FAX: (602) 990-8468